

Fixing a TRS-80 or Osborne Power Supply

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I have seen this on TRS-80 and Osborne computers, but this applies to many older computer power supplies. You turn the power on one day, and noxious smoke comes out of your vintage pride and joy. Fear not, most likely it is just the power supply input cap, what is referred to as the X cap. These are metalized polyester film caps and like many capacitors, they have a limited life before they blow in spectacular fashion. The good news is, your power supply is probably OK. The cap did not blow because of a problem with the power supply. It blew because the cap was just old. Replace the cap, and the problem is solved.

The picture to the right shows examples of these caps. All six capacitors in the picture are bad, but only the two large caps at the bottom of the picture actually blew. The smaller caps are getting ready to blow as shown by the bulging or cracked cases.



TRS-80 Mode III, 4, 4P, and Osborne computers typically use one or more Astec power supplies. Two different Astec power supplies are shown below, the upper picture with a blown cap (picture borrowed from [here](#)), and the lower pictures with a cap that is close to blowing. Note the cracks in the plastic case on the cap that is about to blow. The caps are marked with red arrows. The blown cap is marked with the yellow arrow. It is typically the larger cap that blows.

To fix the power supply, all you need is a [replacement cap](#), and a soldering iron. The hard part, however, is finding the replacement cap.

These are special UL listed AC voltage X caps. The X has special meaning for UL and fire safety. So if you replace them, make sure you get the right type cap. The specific features you are looking for are:

For the large cap:

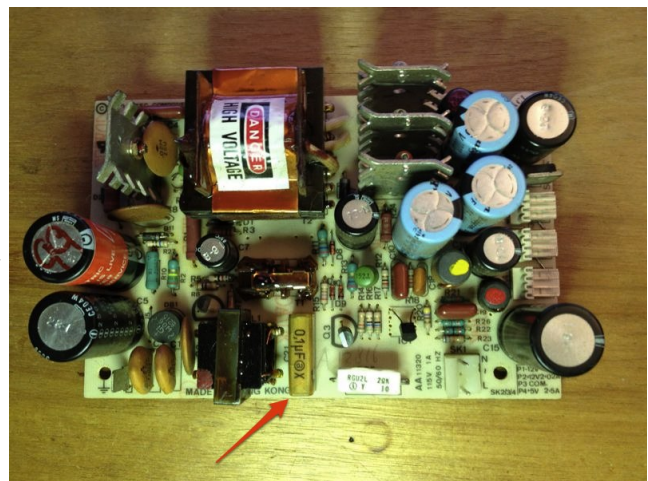
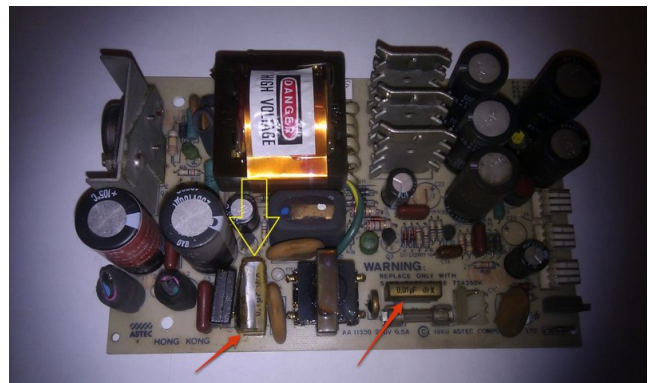
- 0.1uF, 275VAC, X2 (or X1 300V will work)

For the small cap:

- 0.01uF, 275VAC, X2 (or X1 300V will work)

These will almost always be some form of metalized polyester or plastic film capacitor. There are many types and sizes, but the specs above are the critical things to look for. Getting the same dimensions is preferred, but not absolutely required. Note it's 275 **VAC**, not **VDC**. The capacitors are specifically rated for 50 and 60 Hz AC power supplies. That is why they are called X caps.

For my power supplies, I bought some Evox-RIFA 0.1uF X2 caps (RIFA PME271M610M) from Allied Electronics for the larger cap, and RIFA 0.01uF caps for the smaller caps. Unfortunately, Allied doesn't list the 0.1uF cap anymore. They have the smaller cap, though.



Here are some alternative sources that should work (please let me know if any links are broken).

0.1uF, 275VAC, X2 cap

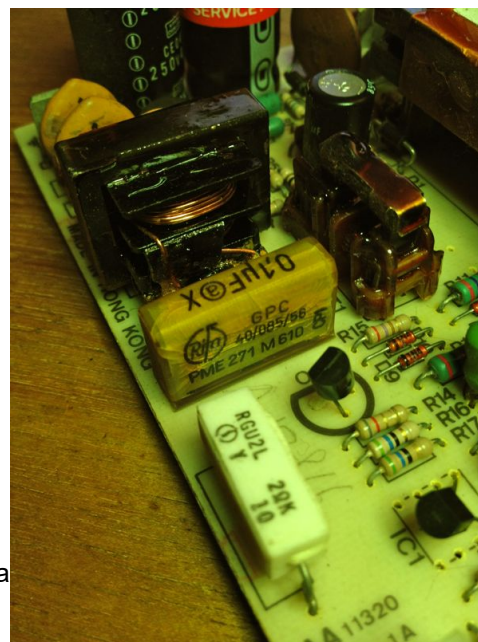
- [Kemet - PME271M610MR30](#) (Mouser)
- [Evox RIFA - PME271M610M](#) (Farnell)
- [Kemet - PME271M610MR30](#) (Digikey)

0.01uF, 275VAC, X2 cap

- [Kemet - PME271M510MR30](#) (Mouser)
- [Kemet - PME271M510MR30](#) (Digikey)
- [Evox-Rifa PME271M510M](#) (Allied Electronics)

Or download the datasheet for the [Evox-RIFA PME271 Series capacitors](#). I have highlighted the two caps.

Other X type caps with similar specs should work, even if they are physically a different size, but the above listed caps a



Last Updated: Thu, Mar 14, 2013

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